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| EXAMINER | |
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| KAO, JUTAI | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. 10/733,962 | Applicant(s) TANIS ET AL. |
|---|---|---|
| | Examiner Ju-Tai Kao | Art Unit 2616 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 16-25* is/are rejected.

7)☒ Claim(s) *13-15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

The amendments filed on 10/04/2007 have been entered. It is noted that the amendments changes the scope of the original claims. The original claims rejections are modified to read on the newly amended claims.

### *Response to Arguments*

1. Applicant's arguments, see applicant's remarks page 9-10, filed 10/04/2007, with respect to 35 USC 112 rejections have been fully considered and are persuasive. The 35 USC 112 rejections of claims 1-25 have been withdrawn.

2. Applicant's arguments made against the prior art rejections filed 10/04/2007 have been fully considered but they are not persuasive.

Regarding claim 1-5, 13-15, and 17-25, the applicant argues that the cited reference, Williams, does not suggest the claimed overflow time slots and that Williams describes a time slot assignment of $p = m$, instead of the claimed $p < m$.

However, as described in the previous action, $p = 2$ time slots are assigned to the data collection M in Fig. 2J. That is, of the 6 total time slots are assigned to the data collection M, there comprises 2, or p, time slots being assigned to the data collection M. Thus, the number of timeslots of the data collection M is 6, which represents the claimed variable m, is greater than the $p = 2$ timeslots being allocated in time slots 3 and 18 as shown in Fig. 2J. And besides the 2 timeslots assigned to data collection M,

the rest of the time slots shown in Fig. 2J and K are all considered overflowing time slots since they are part of the p time slots already assigned to the data collection M. That is, these time slots are overflowing from the p time slots assigned to M. In addition, the other 4 time slots of data collection M that were not assigned to the p time slots are considered overflow set of data from the m sets of data since they are overflowing from the p time slots that were assigned. Williams shows in Fig. 2J and K that these 4 time slots are assigned to the overflowing time slots. Therefore, the arguments are not persuasive as Williams does cover all elements of the claims.

Regarding claims 6-12, the applicant first argues that the cited reference, Eyeson, does not describe "a system that includes at least two timeslot interchanges coupled to at least one space switch, different first and second routes exist via the at least two timeslot interchanges and the at least one space switch". However, according to the previous office action, these limitations were actually covered by the reference, Aicklen, which were used to reject the claims including these limitations.

The applicant also argues that Boily does not describe that "a capacity of the timeslot interchanges to support a number of connections of the first type and a second type is exceeded if a connection is routed via the timeslot interchange. However, as shown in the previous action, Boily does describe that the timeslot interchange system 10 having "an upper limit to the number of connections that system 10 is capable of processing", or the capability to determine whether capacity of the system to support a number of connections is exceeded. And as shown in the previous action, Williams

shows the first and second type of connections. For example, the first type includes the data collection M, and the second type includes the rest of the data collections. Since each data collection could be considered a connection and Boily keeps track of the number of connections and produces an alarm when the number of connections exceeds the upper limit, Boily does suggest the ability to determine when the capacity has been exceeded (the alarm condition).

The applicant also argues that labels "M" and "N" are of the same types. However, the labels M and N were only used as an example of having two different types of data collection. In addition, the claim does not limit that "type" has to be referred to signals of the same bit rate or size. Furthermore, Williams also shows other data collections within Fig. 2J and K that have different sizes, such as data collection A. Therefore, the argument is not considered persuasive.

Regarding claim 16, the applicant again argues the deficiency of claim 1, which has been covered in the above paragraphs. The applicant further argues that Lappetelamen fails to describe searching for (m-1) or (m-3) timeslots if the connection is of the first type. However, Lappetelamen does disclose, as shown in the previous action, that the number of timeslots would be decided by the type of the connection. That is, Lappetelamen discloses searching for a predetermined number of timeslots if the connection is of a predetermined type. Lappetelamen is only not showing specifically (m-1) or (m-3). However, as shown in the previous office action, it was determined that the number (m-1) and (m-3) does not introduce any significance. One

of ordinary skill in the art could modify the number of timeslots as needed to transmit and provide the required quality of service to the particular type of connection. And as cited in the MPEP in the previous action, the specific number of timeslots used in the claim does not make the claim patently distinct from that disclosed in Lappetelamen.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claim 1-5, and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Williams (US 6,356,550).

Williams discloses a flexible time division multiplexed bus using SONET formatting including the following features.

Regarding claim 1, a method for switching multi-rate communications (see "communications system transports facility signals including: DS1, DS2, and DS3 signals, a 2.048 Mbps E1 signal...in addition to the 51.84 Mbps SONET STS-1 level signal" recited in column 6, line 63-67) within a communications format comprised of frames, each frame having multiple timeslots (see frames with multiple timeslots shown in Fig. 2J and K), the method comprising: obtaining a first data collection comprising m sets of data (see Fig. 2H, with 6 sets of data collection M; m = 6); allocating p timeslots from a frame to the first data collection (see timeslots 3 and 18 in Fig. 2J, where p = the 2 time slots 3 and 18), where p is less than m (p = 2 < m = 6); providing at least one overflow timeslot from the frame for use with different data collections (see timeslot 1-2, 4-17, and 19-87, used for different data collections including A-D, M-O, and X-Z); filling the p timeslots with p sets of data from the m sets of data within the first data collection (see Fig. 2J, timeslot 3 and 18, the two timeslots filled with 2 sets (p = 2) of data from data collection M of the Virtual Tributary 3 type (VT3); Fig. 2H shows that collection M is a VT3); and loading the at least one overflow timeslot with at least one overflow set of data from the m sets of data within the first data collection (at least one of the previously listed overflow timeslot, for example, slot 33, is filled with one of the overflowing set of M data collection as shown in Fig. 2J).

Regarding claim 2, filling a second set of p timeslots with p sets of data from a second data collection of the first type (see Fig. 2J, slot 11 and 25, the two timeslots filled with two sets of N data from the data collection N of the VT3 type as shown in Fig.

2H), wherein the second data collection includes m sets of data (see Fig. 2H, data collection N also includes 6 slots of data).

Regarding claim 3, loading the at least one overflow timeslot (see Fig. 2J, slot 11, overflowing since it's not one of the first set of p timeslots) with at least one overflow set of data (see Fig. 2J, slot 11, which is filled with data N) from a second data collection (Fig. 2J, slot 11 is filled with data from the N data collection) of the first type (see Fig. 2H, N is also of the VT3 type), wherein the second data collection includes m sets of data (see Fig. 2H, data collection N also includes 6 sets of data).

Regarding claim 4, filling a second set of p timeslots with p sets of data from a second data collection (see Fig. 2J, slots 4 and 12, which are 2 sets of timeslots filled with 2 sets of data from the data collection O), wherein the second data collection is of a second type that is different than the first type (see Fig. 2I, where data collection O is of the VT6 type) and the second data collection includes p sets of data (see Fig. 2I, data collection includes 2 sets of data, and a total of 12 sets of data).

Regarding claim 5, filling a second set of p timeslots with p sets of data from a second data collection (see Fig. 2J, two sets of timeslots 1 and 31, each filled with two sets of data A from the data collection A), wherein the second data collection is of a second type that is different than the first type (see Fig. 2F, where data collection A is of the type VT1), wherein the second type is a DS1 type (see "to transmit DS1 signal, VT1 uses..." recited in column 2, line 36); and filling a second set of p timeslots with p sets of data from the second data collection (see Fig. 2J, two sets of timeslots 1 and 31, each filled with two sets of data A from the data collection A).

Regarding claim 17, a method for switching multi-rate communications (see "communications system transports facility signals including: DS1, DS2, and DS3 signals, a 2.048 Mbps E1 signal...in addition to the 51.84 Mbps SONET STS-1 level signal" recited in column 6, line 63-67) comprising: obtaining first, second and third data collections of a first data type, each of the first, second and third data collections comprising m sets of data (see Fig. 2G, data collections X, Y, and Z of the type VT 2, each having 4 sets of data, thus m = 4); allocating p timeslots, from frames of a communication format, to each of the first, second and third data collections, where p is less than m (see Fig. 2J-2K, for data collection X: timeslot 2, 24 and 46; for data collection Y, timeslots 10, 32, and 53; and for data collection Z: timeslot 17, 37, and 61; that is, p = 3, which is less than m = 4); providing at least one overflow timeslot, from the frames of the communication format, for use with the first, second, and third data collections (see Fig. 2J-2K, slots 68, 77, and 82, which are overflowing from the three separate p sets of timeslots listed above, are used for data collections X, Y and Z); filling first, second, and third sets of p timeslots with p sets of data from the first, second and third data collections respectively (see Fig. 2J-2K, for data collection X: timeslot 2, 24 and 46; for data collection Y, timeslots 10, 32, and 53; and for data collection Z: timeslot 17, 37, and 61; that is, p = 3, which is less than m = 4); and loading overflow timeslots with an mth set of data of the first data collection, an mth set of data of the second data collection, and an mth set of data of the third data collection (see Fig. 2J, where timeslots 68, 77, and 82 are filled with the fourth set of data X, Y and Z respectively).

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 6,356,550) in view of Eyeson (US 2003/0223568) and Boily (US 2004/0001454).

Williams discloses the claimed limitations above.

Williams does not disclose the following features: regarding claim 6, wherein a network system includes a number of timeslot interchanges, said method further comprising determining whether a capacity of the timeslot interchanges to support a

number of connections of the first type and a second type is exceeded if a connection is routed via the timeslot interchanges.

Eyeson discloses a method and apparatus for automatically directing calls by an invisible agent in a switch including the following features.

Regarding claim 6, wherein a network system (see Fig. 1, which shows a WAN network) includes a number of timeslot interchanges (see Fig. 1, which includes remote switch 102 and 108, and Fig. 2, which shows the detail of each remote switch and includes time slot interchange TSI 206).

Boily discloses a timeslot interchange switch including the following features.

Regarding claim 6, said method further comprising determining whether a capacity of the timeslot interchanges to support a number of connections (see "there is an upper limit to the number of connections that system 10 is capable of processing...system 10 may maintain a count of active locations 48 and signal an alarm if a number of active locations 48 exceeds a threshold" recited in paragraph 43, wherein the system 10 is part of a time slot interchange switch shown in Fig. 1, and active location represents connections) of the first type (described in the rejection to claim 1 above) and a second type (described in Williams, e.g. data collection other than type M of Williams) is exceeded if a connection is routed via the timeslot interchanges (again, system 10 being the timeslot interchange switch).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify the system of Williams using features, as taught by Eyeson and

Boily, in order to provide a non-blocking multi-rate transmission in a communication network involving different type of signals.

6. Claim 7, 10, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 6,356,550) in view of Aicklen (US 7,145,867) and Eyeson (US 2003/0223568).

Williams discloses the claimed limitations above. Williams does not disclose the following features: regarding claim 7, wherein a network system includes at least two timeslot interchanges coupled to at least one space switch, different first and second routes exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: routing the p sets of data of the first data collection via the first route if the first route is unblocked; and selecting p timeslots of the second route if the first route is blocked; regarding claim 10, wherein a network system includes at least two timeslot interchanges coupled to at least one space switch, different first and second routes exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising selecting an nth timeslot of the second route if the first route is blocked; regarding claim 18, wherein a network system includes at least two timeslot interchanges coupled to at least one space switch, a first route and a second route exists via the at least two timeslot interchanges and the at least one space switch, and the first route is different than the second route, said method further comprising: routing the p sets of data of the first data collection via the first route if the

first route is unblocked; and selecting p timeslots of the second route different than the first route if the first route is blocked

Aicklen discloses the system and method for slot deflection routing including the following features.

Regarding claim 7, wherein a network system (see network system including five edge units in Fig. 7) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 7, edge units 0-4; each edge unit could can be a router or switch, see "router...edge unit" recited in column 1, line 32-35; and each router could contain a timeslot interchange and a space switch as will be explained below using the Eyeson reference), different first and second routes (see Fig. 7, route 335 and route 333-2, 333-5) exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: routing the p sets of data of the first data collection (explained in the rejection made to claim 1) via the first route if the first route is unblocked (see Fig. 6, where the route between edge unit 2 and 3 are unblocked, and data in timeslot T0 is transferred in route 333-0); and selecting p timeslots of the second route if the first route is blocked (see Fig. 7, where the route between edge unit 2 and 3 are blocked, and data are transferred through 333-2, 333-5 in timeslot TS2 and TS5; also see "a failure in the link..." recited in column 11, line 37-55).

Regarding claim 10, wherein a network system (see network system including five edge units in Fig. 7) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 7, edge units 0-4; each edge unit could can be a router or switch, see "router...edge unit" recited in column 1, line 32-35; and each router could

contain a timeslot interchange and a space switch as will be explained below using the Eyeson reference), different first and second routes (see Fig. 7, route 335 and route 333-2, 333-5) exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising selecting an nth timeslot (see timeslot T2, in Fig. 7) of the second route (see route 333-2 in Fig. 7) if the first route is blocked (see "a failure in the link from EU2 to EU3..." recited in column 11, line 37-55).

Regarding claim 18, wherein a network system (see network system including five edge units in Fig. 7) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 7, edge units 0-4; each edge unit could can be a router or switch, see "router...edge unit" recited in column 1, line 32-35; and each router could contain a timeslot interchange and a space switch as will be explained below using the Eyeson reference), different first and second routes (see Fig. 7, route 335 and route 333-2, 333-5) exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: routing the p sets of data of the first data collection (explained above in the rejection made in claim 17) via the first route if the first route is unblocked (see Fig. 6, where the route between edge unit 2 and 3 are unblocked, and data in timeslot T0 is transferred in route 333-0); and selecting p timeslots of the second route different than the first route if the first route is blocked (see Fig. 7, where the route between edge unit 2 and 3 are blocked, and data are transferred through 333-2, 333-5 in timeslot TS2 and TS5; also see "a failure in the link..." recited in column 11, line 37-55).

Eyeson discloses the method and apparatus for automatically directing calls by an invisible agent in a switch.

Regarding claim 7, wherein a network system (explained in Aicklen above) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 1 showing remote switch 102, which is again shown in Fig. 2 showing that the remote switch includes a router portion 221 and a circuit switch portion 223; the router portion includes a time slot interchange portion TSI 206, and the circuit switch being a space switch; thus, each of the edge unit in Aicklen can be modified to include a TSI coupled to a router, thus each route in Aicklen includes two TSI coupled to two space switch from the two edge units connected to form the route), different first and second routes exist via the at least two timeslot interchanges and the at least one space switches (explained above, each routes in Aicklen includes two TSI coupled to two space switches).

Regarding claim 10, wherein a network system (explained in Aicklen above) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 1 showing remote switch 102, which is again shown in Fig. 2 showing that the remote switch includes a router portion 221 and a circuit switch portion 223; the router portion includes a time slot interchange portion TSI 206, and the circuit switch being a space switch; thus, each of the edge unit in Aicklen can be modified to include a TSI coupled to a router, thus each route in Aicklen includes two TSI coupled to two space switch from the two edge units connected to form the route), different first and second routes exist via the at least two timeslot interchanges and the at least one space

switches (explained above, each routes in Aicklen includes two TSI coupled to two space switches).

Regarding claim 18, wherein a network system (explained in Aicklen above) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 1 showing remote switch 102, which is again shown in Fig. 2 showing that the remote switch includes a router portion 221 and a circuit switch portion 223; the router portion includes a time slot interchange portion TSI 206, and the circuit switch being a space switch; thus, each of the edge unit in Aicklen can be modified to include a TSI coupled to a router, thus each route in Aicklen includes two TSI coupled to two space switch from the two edge units connected to form the route), different first and second routes exist via the at least two timeslot interchanges and the at least one space switches (explained above, each routes in Aicklen includes two TSI coupled to two space switches).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify the system of Williams using features, as taught by Aicklen and Eyeson, in order to provide a non-blocking multi-rate transmission in a communication network involving different type of signals and prevent packets being dropped from path failure.

7. Claim 8, 9, 11, 12, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 6,356,550) in view of Aicklen (US 7,145,867) Eyeson (US 2003/0223568) and Akahane (US 2001/0050914).

Williams discloses the claimed limitations above. Williams does not disclose the following features: regarding claim 8, wherein a network system includes at least two timeslot interchanges coupled to at least one space switch, different first and second routes exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: selecting p timeslots of the second route if the first route is blocked; and performing a sequential search for the second route by identifying, in a consecutive fashion within the at least two timeslot interchanges, the p timeslots; regarding claim 9, wherein a network system includes at least two timeslot interchanges coupled to at least one space switch, a first route and a second route exists via the at least two timeslot interchanges and the at least one space switch, and the first route is different than the second route, said method further comprising: selecting p timeslots of a second route different than a first route via at least two timeslot interchanges and at least one space switch for transporting the p sets of data from the first data collection if the first route is blocked; and performing a uniform search for the second route by determining whether the p timeslots have less load than loads of remaining timeslots within the at least two timeslot interchanges; regarding claim 11, wherein a network system includes at least two timeslot interchanges coupled to at least one space switch, different first route and second routes exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: selecting an nth timeslot of the second route if the first route is blocked; and performing a sequential search for the second route by identifying, in a consecutive fashion within the at least two timeslot interchanges, the nth timeslot; regarding claim 12, wherein a network

system includes at least two timeslot interchanges coupled to at least one space switch, different first route and second routes exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: selecting an nth timeslot of the second route if the first route is blocked; and performing a uniform search for the second route by determining whether the nth timeslot has less load than loads of remaining timeslots within the at least two timeslot interchanges; regarding claim 19, wherein a network system includes at least two timeslot interchanges coupled to at least one space switch, a first route and a second route exists via the at least two timeslot interchanges and the at least one space switch, and the first route is different than the second route, said method further comprising: selecting p timeslots within the second route for transporting the p sets of data from the first data collection if the first route is blocked; and performing a sequential search for the second route by identifying, in a consecutive fashion within the at least two timeslot interchanges, the p timeslots within the second route; regarding claim 20, wherein a network system includes at least two timeslot interchanges coupled to at least one space switch, a first route and a second route exists via the at least two timeslot interchanges and the at least one space switch, and the first route is different than the second route, said method further comprising: selecting an nth timeslot of the second route if the first route is blocked; and performing a uniform search for the second route by determining whether the nth timeslot has less load than loads of remaining timeslots within the at least two timeslot interchanges.

Aicklen discloses the system and method for slot deflection routing including the following features.

Regarding claim 8, wherein a network system (see network system including five edge units in Fig. 7) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 7, edge units 0-4; each edge unit could can be a router or switch, see "router...edge unit" recited in column 1, line 32-35; and each router could contain a timeslot interchange and a space switch as will be explained below using the Eyeson reference), different first and second routes (see Fig. 7, route 335 and route 333-2, 333-5) exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: selecting p timeslots of the second route (see timeslot T2 and T5 in Fig. 7) if the first route is blocked (see "a failure in the link from EU2 to EU3..." recited in column 11, line 37-55).

Regarding claim 9, wherein a network system (see network system including five edge units in Fig. 7) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 7, edge units 0-4; each edge unit could can be a router or switch, see "router...edge unit" recited in column 1, line 32-35; and each router could contain a timeslot interchange and a space switch as will be explained below using the Eyeson reference), different first and second routes (see Fig. 7, route 335 and route 333-2, 333-5) exist via the at least two timeslot interchanges and the at least one space switch and the first route is different than the second route (see Fig. 7, first route being route 335 and second route being route 333-2, 333-5), said method further comprising: selecting p timeslots of the second route (see route 333-2 and 333-5 carrying timeslot T2 and T5 in Fig. 7) different than a first route (see Fig. 7, route 335) via at least two timeslot interchanges and at least one space switch (see Fig. 7, second route includes edge

units 0, 2 and 3, and each edge unit includes a TSI and a space switch as explained below in Eyeson) for transporting the p sets of data from the first data collection (explained in Williams above) if the first route is blocked (see "a failure in the link from EU2 to EU3..." recited in column 11, line 37-55); determining whether the p timeslots have less load than loads of remaining timeslots within the at least two timeslot interchanges (see "Now, consider a doubling in traffic..." recited in column 10, line 22-42, wherein the reference describes that the original route between two edge units could not handle the extra traffic, and the system looks to route the extra traffic through a second route with a lower capacity fill ratio that could handle the extra traffic).

Regarding claim 11, wherein a network system (see network system including five edge units in Fig. 7) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 7, edge units 0-4; each edge unit could can be a router or switch, see "router...edge unit" recited in column 1, line 32-35; and each router could contain a timeslot interchange and a space switch as will be explained below using the Eyeson reference), different first and second routes (see Fig. 7, route 335 and route 333-2, 333-5) exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: selecting an nth timeslot of the second route (see timeslot T2 and T5 in Fig. 7) if the first route is blocked (see "a failure in the link from EU2 to EU3..." recited in column 11, line 37-55).

Regarding claim 12, wherein a network system (see network system including five edge units in Fig. 7) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 7, edge units 0-4; each edge unit could can be a router or

switch, see "router...edge unit" recited in column 1, line 32-35; and each router could contain a timeslot interchange and a space switch as will be explained below using the Eyeson reference), different first and second routes (see Fig. 7, route 335 and route 333-2, 333-5) exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: selecting an nth timeslot of the second route (see timeslot T2 and T5 in Fig. 7) if the first route is blocked (see "a failure in the link from EU2 to EU3..." recited in column 11, line 37-55); determining whether the nth timeslot has less load than loads of remaining timeslots within the at least two timeslot interchanges (see "Now, consider a doubling in traffic..." recited in column 10, line 22-42, wherein the reference describes that the original route between two edge units could not handle the extra traffic, and the system looks to route the extra traffic through a second route with a lower capacity fill ratio that could handle the extra traffic).

Regarding claim 19, wherein a network system (see network system including five edge units in Fig. 7) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 7, edge units 0-4; each edge unit could can be a router or switch, see "router...edge unit" recited in column 1, line 32-35; and each router could contain a timeslot interchange and a space switch as will be explained below using the Eyeson reference), different first and second routes (see Fig. 7, route 335 and route 333-2, 333-5) exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: selecting p timeslots within the second route for transporting the p sets of data (p sets of data are explained in the rejection to claim 17 above) from the first data collection if the first route is blocked (see Fig. 7, where the

route between edge unit 2 and 3 are blocked, and data are transferred through 333-2, 333-5 in timeslot TS2 and TS5; also see “a failure in the link...” recited in column 11, line 37-55).

Regarding claim 20, wherein a network system (see network system including five edge units in Fig. 7) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 7, edge units 0-4; each edge unit could can be a router or switch, see “router...edge unit” recited in column 1, line 32-35; and each router could contain a timeslot interchange and a space switch as will be explained below using the Eyeson reference), different first and second routes (see Fig. 7, route 335 and route 333-2, 333-5) exist via the at least two timeslot interchanges and the at least one space switch, said method further comprising: selecting an nth timeslot of the second route (see timeslot T2 and T5 in Fig. 7) if the first route is blocked (see “a failure in the link from EU2 to EU3...” recited in column 11, line 37-55); determining whether the nth timeslot has less load than loads of remaining timeslots within the at least two timeslot interchanges (see “Now, consider a doubling in traffic...” recited in column 10, line 22-42, wherein the reference describes that the original route between two edge units could not handle the extra traffic, and the system looks to route the extra traffic through a second route with a lower capacity fill ratio that could handle the extra traffic).

Eyeson discloses the method and apparatus for automatically directing calls by an invisible agent in a switch.

Regarding claim 8, wherein a network system (explained in Aicklen above) includes at least two timeslot interchanges coupled to at least one space switch (see

Fig. 1 showing remote switch 102, which is again shown in Fig. 2 showing that the remote switch includes a router portion 221 and a circuit switch portion 223; the router portion includes a time slot interchange portion TSI 206, and the circuit switch being a space switch; thus, each of the edge unit in Aicklen can be modified to include a TSI coupled to a router, thus each route in Aicklen includes two TSI coupled to two space switch from the two edge units connected to form the route), different first and second routes exist via the at least two timeslot interchanges and the at least one space switches (explained above, each routes in Aicklen includes two TSI coupled to two space switches).

Regarding claim 9, wherein a network system (explained in Aicklen above) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 1 showing remote switch 102, which is again shown in Fig. 2 showing that the remote switch includes a router portion 221 and a circuit switch portion 223; the router portion includes a time slot interchange portion TSI 206, and the circuit switch being a space switch; thus, each of the edge unit in Aicklen can be modified to include a TSI coupled to a router, thus each route in Aicklen includes two TSI coupled to two space switch from the two edge units connected to form the route), different first and second routes exist via the at least two timeslot interchanges and the at least one space switches (explained above, each routes in Aicklen includes two TSI coupled to two space switches).

Regarding claim 11, wherein a network system (explained in Aicklen above) includes at least two timeslot interchanges coupled to at least one space switch (see

Fig. 1 showing remote switch 102, which is again shown in Fig. 2 showing that the remote switch includes a router portion 221 and a circuit switch portion 223; the router portion includes a time slot interchange portion TSI 206, and the circuit switch being a space switch; thus, each of the edge unit in Aicklen can be modified to include a TSI coupled to a router, thus each route in Aicklen includes two TSI coupled to two space switch from the two edge units connected to form the route), different first and second routes exist via the at least two timeslot interchanges and the at least one space switches (explained above, each routes in Aicklen includes two TSI coupled to two space switches).

Regarding claim 12, wherein a network system (explained in Aicklen above) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 1 showing remote switch 102, which is again shown in Fig. 2 showing that the remote switch includes a router portion 221 and a circuit switch portion 223; the router portion includes a time slot interchange portion TSI 206, and the circuit switch being a space switch; thus, each of the edge unit in Aicklen can be modified to include a TSI coupled to a router, thus each route in Aicklen includes two TSI coupled to two space switch from the two edge units connected to form the route), different first and second routes exist via the at least two timeslot interchanges and the at least one space switches (explained above, each routes in Aicklen includes two TSI coupled to two space switches).

Regarding claim 19, wherein a network system (explained in Aicklen above) includes at least two timeslot interchanges coupled to at least one space switch (see

Fig. 1 showing remote switch 102, which is again shown in Fig. 2 showing that the remote switch includes a router portion 221 and a circuit switch portion 223; the router portion includes a time slot interchange portion TSI 206, and the circuit switch being a space switch; thus, each of the edge unit in Aicklen can be modified to include a TSI coupled to a router, thus each route in Aicklen includes two TSI coupled to two space switch from the two edge units connected to form the route), different first and second routes exist via the at least two timeslot interchanges and the at least one space switches (explained above, each routes in Aicklen includes two TSI coupled to two space switches).

Regarding claim 20, wherein a network system (explained in Aicklen above) includes at least two timeslot interchanges coupled to at least one space switch (see Fig. 1 showing remote switch 102, which is again shown in Fig. 2 showing that the remote switch includes a router portion 221 and a circuit switch portion 223; the router portion includes a time slot interchange portion TSI 206, and the circuit switch being a space switch; thus, each of the edge unit in Aicklen can be modified to include a TSI coupled to a router, thus each route in Aicklen includes two TSI coupled to two space switch from the two edge units connected to form the route), different first and second routes exist via the at least two timeslot interchanges and the at least one space switches (explained above, each routes in Aicklen includes two TSI coupled to two space switches).

Akahane discloses the VPN router and VPN identification method by using logical channel identifiers including the following features.

Regarding claim 8, performing a sequential search (see "a sequential table search method" recited in paragraph 72, where the tables are VPN identification tables which are used to determines the routing of data streams) for a second route (explained above in Aicklen) by identifying, in a consecutive fashion (sequential search is considered to be in a consecutive fashion) within the at least two timeslot interchanges (disclosed in Aicklen and Eyeson above), the p timeslots (timeslots T2 and T5 in Aicklen as explained above).

Regarding claim 9, performing a uniform search (see "a sequential table search method" recited in paragraph 72, where the tables are VPN identification tables which are used to determines the routing of data streams) for a second route (explained above in Aicklen) by determining whether the p timeslots have less load than loads of remaining timeslots within the at least two timeslot interchanges (explained in Aicklen above).

Regarding claim 11, performing a sequential search (see "a sequential table search method" recited in paragraph 72, where the tables are VPN identification tables which are used to determines the routing of data streams) for a second route (explained above in Aicklen) by identifying, in a consecutive fashion (sequential search is considered to be in a consecutive fashion) within the at least two timeslot interchanges (disclosed in Aicklen and Eyeson above), the nth timeslot (timeslots T2 and T5 in Aicklen as explained above).

Regarding claim 12, performing a uniform search (see "a sequential table search method" recited in paragraph 72, where the tables are VPN identification tables which

are used to determines the routing of data streams) for a second route (explained above in Aicklen) by determining whether the nth timeslot has less load than loads of remaining timeslots within the at least two timeslot interchanges (explained in Aicklen above).

Regarding claim 19, performing a sequential search (see "a sequential table search method" recited in paragraph 72, where the tables are VPN identification tables which are used to determines the routing of data streams) for the second route (explained above in Aicklen) by identifying, in a consecutive fashion (sequential search is considered to be in a consecutive fashion) within the at least two timeslot interchanges (disclosed in Aicklen and Eyeson above), the p timeslots within the second route (timeslots T2 and T5 in Aicklen as explained above).

Regarding claim 20, performing a uniform search (see "a sequential table search method" recited in paragraph 72, where the tables are VPN identification tables which are used to determines the routing of data streams) for a second route (explained above in Aicklen) by determining whether the nth timeslot has less load than loads of remaining timeslots within the at least two timeslot interchanges (explained in Aicklen above).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify the system of Williams using features, as taught by Aicklen, Eyeson and Akahane, in order to provide a non-blocking multi-rate transmission in a communication network involving different type of signals and prevent packets being dropped from failed or congested path.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 6,356,550) in view of Lappetelamen (US 6,693,915).

Williams discloses the claimed limitations above.

Williams also discloses the following features, searching one timeslot if the connection is of the first type (see Fig. 2J, data of the first type A is placed in timeslots 1).

Williams does not disclose the following features: regarding claim 16, determining whether a connection is one of the first type and a second type; and searching for one of (m-1) timeslots and (m-3) timeslots if the connection is of the first type.

Lappetelamen discloses a method of efficient bandwidth allocation for high-speed wireless data transmission system including the following features.

Regarding claim 16, determining (see "transmits information...on the connection type" recited in column 8, line 34-37) whether a connection is one of the first type and a second type (see "e.g. multimedia connection, data connection" recited in column 8, line 34-37); and searching for one of (m-1) timeslots and (m-3) slots if the connection is of the first type (see "The type of the connection...affect...the number of timeslots...to be allocated for the connection" recited in column 8, line 37-39).

Although, Lappetelamen does not specifically disclose using one of (m-1) timeslots and (m-3) timeslots for the connection of the first type, it is determined any number of timeslots can be used for a connection of the first type. Therefore, it would

have been obvious to one of ordinary skill in the art at the time of the invention to modify the number of timeslots used for the connection of the first type in order to transmit the provide the required quality of service to the particular type of connection. The specific number of timeslots used recited in the claimed invention is not patently distinct from the reference of Lappetelamen because:

MPEP 2144.04, section IV A states:

"IV. CHANGES IN SIZE, SHAPE, OR SEQUENCE OF ADDING INGREDIENTS

A. Changes in Size/Proportion

In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device."

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Williams using features, as taught by Lappetelamen, in order to provide the desired quality of service for the different type of connections.

9. Claim 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US 6,356,550) in view of Boily (US 2004/0001454).

Williams discloses a flexible time division multiplexed bus using SONET formatting including the following features.

Regarding claim 21, a system for switching multi-rate communications (see "communications system transports facility signals including: DS1, DS2, and DS3 signals, a 2.048 Mbps E1 signal...in addition to the 51.84 Mbps SONET STS-1 level signal" recited in column 6, line 63-67) comprising: at least a first data collection (see data collection X in Fig. 2G and 2J) having a common first type (see Fig. 2G, data collection 2G is of the common VT2 type), wherein the first data collection includes m sets of data (see Fig. 2G, where there are 4 sets of X data, that is, m = 4); p sets of data of the first data collection are communicated to a first set of p timeslots (see Fig. 2J, wherein 3 sets of data collection X are filled into 3 timeslots, timeslots 2, 24, and 46; that is, p = 3) and from which at least one overflow set of data from the first data collection is communicated to at least one overflow timeslot (see Fig. 2J, a fourth set of data X is filled in timeslot 68) wherein p is less than m (p = 3, m = 4 as explained above).

Regarding claim 22, a system for switching multi-rate communications (see "communications system transports facility signals including: DS1, DS2, and DS3 signals, a 2.048 Mbps E1 signal...in addition to the 51.84 Mbps SONET STS-1 level signal" recited in column 6, line 63-67) comprising: receive a plurality of connections (see the multiple connections, A-D, X-Z, M-O in Fig. 2F-2I) and transform the plurality of connections into a system data format (see Fig. 2J-2K, where the VT1, VT2, VT3, and VT6 connections shown in Fig. 2F-2I are transformed into a single SONET STS-1 format).

Regarding claim 24, receive at least a first, a second, and a third data collection (see data collections X, Y and Z in Fig. 2G and 2J), wherein each of the first, the second, and the third data collection have a common first type (see Fig. 2G, X, Y and Z are of the type VT2), and each of the first, the second, and the third data collection include m sets of data (see Fig. 2G, X, Y, and Z each include four sets of data); and p sets of data from the first data collection are communicated to a first set of p timeslots (see Fig. 2J-2K, timeslot 2, 24 and 46, each filled with data from data collection X, p = 3), p sets of data from the second data collection are communicated to a second set of p timeslots (see Fig. 2J, timeslot 10, 32, and 53 are filled with three sets of data from the data collection Y, which is shown in Fig. 2G), p sets of data from the third data collection are communicated to a third set of p timeslots (see Fig. 2J, timeslot 17, 37, and 61 are filled with three sets of data from the data collection Z, which is shown in Fig. 2G), an mth set of data from the first data collection (see Fig. 2G, the fourth set of data in collection X) are communicated to a fourth set of p timeslots (see Fig. 2J, timeslots 68, 77, and 82, where timeslot 68 contains the fourth set of data X), an mth set of data from the second data collection are communicated to the fourth set of p timeslots (see Fig. 2J, timeslots 68, 77, and 82, where timeslot 77 contains the fourth set of data Y), and an mth set of data from the third data collection are communicated to the fourth set of p timeslots (see Fig. 2J, timeslots 68, 77, and 82, where timeslot 82 contains the fourth set of data X).

Regarding claim 25, receive a plurality of connections (see the multiple connections, A-D, X-Z, M-O in Fig. 2F-2I) and transform the plurality of connections into

a system data format (see Fig. 2J-2K, where the VT1, VT2, VT3, and VT6 connections shown in Fig. 2F-2I are transformed into a single SONET STS-1 format).

Williams does not disclose the following features: regarding claim 21, a time-space switch element configured to receive at least a first data collection; and a buffer from which p sets of data of the first data collection are communicated; regarding claim 22, an input interface is configured to be coupled to said time-space switch element, wherein said interface is configured to receive a plurality of connections and transform the plurality of connections into a system data format; an output interface configured to be coupled to said time-space switch element, said output interface configured to transform an output of said time-space switch element into the plurality of connections; regarding claim 23, a memory configured to store a program, wherein the program is configured to determine whether a timeslot interchange that includes the memory has a capacity to support a number of connections of the first type and a second type; regarding claim 24, a time-space switch element configured to receive the data collections; and a buffer from which the sets of data are to be communicated towards; regarding claim 22, an input interface is configured to be coupled to said time-space switch element, wherein said interface is configured to receive a plurality of connections and transform the plurality of connections into a system data format; an output interface configured to be coupled to said time-space switch element, said output interface configured to transform an output of said time-space switch element into the plurality of connections.

Boily discloses a timeslot interchange switch including the following features.

Regarding claim 21, a time-space switch element (see “timeslot interchange switch” recited in the abstract and shown in Fig. 1) configured to receive at least a first data collection (explained in Williams above, also see incoming stream 45 and ingress link 12 shown in Fig. 1 and 2); and a buffer (see ingress buffer 30 and egress buffer 32 shown in Fig. 3) from which p sets of data of the first data collection are communicated (explained in Williams above, also see incoming stream 45 and ingress link 12 shown in Fig. 1 and 2).

Regarding claim 22, an input interface (see ingress stage 24, ingress buffer 30 and cross connect 28 in Fig. 3, where the time-space switching occurs) is configured to be coupled to said time-space switch element, wherein said interface is configured to receive a plurality of connections and transform the plurality of connections into a system data format (explained in above in Williams); an output interface (see Fig. 3, egress stage 26 including egress buffer 32) configured to be coupled to said time-space switch element (see Fig. 3, egress stage 26 is part of the TSI system), said output interface configured to transform an output of said time-space switch element into the plurality of connections (see Fig. 4, where the egress buffer 32A is shown, including active locations 48 that holds active connection as explained in paragraph 31-32; each column of egress buffer 32 A containing active locations 48 are output to an output 14 as explained in paragraph 28).

Regarding claim 23, a memory (see “field programmable gate array (FPGA)” recited in paragraph 38) configured to store a program (see System 10 may be implemented a...FPGA...The invention may be embodied in a set of instructions for

configuring an FPGA...to provide apparatus according to the invention" recited in paragraph 38), wherein the program is configured to determine whether a timeslot interchange (see Fig. 1-2, both shows a timeslot interchange switch) has a capacity to support a number of connections (see "in cases where there is an upper limit to the number of connections...system 10 may maintain a count of active locations" recited in paragraph 43) of the first type and a second type (see "switching data of various types..." recited in paragraph 53).

Regarding claim 24, a time-space switch element (see "timeslot interchange switch" recited in the abstract and shown in Fig. 1) configured to receive data collections (explained in Williams above, also see incoming stream 45 and ingress link 12 shown in Fig. 1 and 2); and a buffer (see ingress buffer 30 and egress buffer 32 shown in Fig. 3) from which the sets of data are to be communicated towards (explained in Williams above, also see incoming stream 45 and ingress link 12 shown in Fig. 1 and 2).

Regarding claim 25, an input interface (see ingress stage 24, ingress buffer 30 and cross connect 28 in Fig. 3, where the time-space switching occurs) is configured to be coupled to said time-space switch element, wherein said interface is configured to receive a plurality of connections and transform the plurality of connections into a system data format (explained in above in Williams); an output interface (see Fig. 3, egress stage 26 including egress buffer 32) configured to be coupled to said time-space switch element (see Fig. 3, egress stage 26 is part of the TSI system), said output interface configured to transform an output of said time-space switch element into the plurality of connections (see Fig. 4, where the egress buffer 32A is shown, including

active locations 48 that holds active connection as explained in paragraph 31-32; each column of egress buffer 32 A containing active locations 48 are output to an output 14 as explained in paragraph 28).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify the system of Williams using features, as taught by Boily, in order to provide a non-blocking multi-rate transmission in a communication network involving different type of signals.

## *Allowable Subject Matter*

10. Claim 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

## *Conclusion*

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ju-Tai Kao whose telephone number is (571)272-9719. The examiner can normally be reached on Monday ~Friday 7:30 AM ~5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571)272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ju-Tai Kao

KWANG BIN YAO
SUPERVISORY PATENT EXAMINER